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(56) Documents Cited
GB 2259559 A GB 2200732 A GB 1595189 A
GB 1383564 A US 5243894 A US 4830617 A

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UK CL (Edition N) F3C CTE
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(54) A game beam gun

(57) A game beam gun which allows a player to change the intensity of a shooting beam comprises the power source 6, a trigger switch 11, a shooting beam control means 23 connected to the trigger switch 11 for causing the emission of a shooting beam used as a bullet and light emission intensity setting means 22 connected to the shooting beam control means 23.

The setting means causes the light emitter 33 to be driven by either the first or second light emitter driver 31, 32 according to whether trigger 11 is depressed or not when the power is switched on, the two drivers providing different intensities. The gun also features a reverberation circuit in conjunction with a simple round control means to generate a true shooting sound.

Fig.1

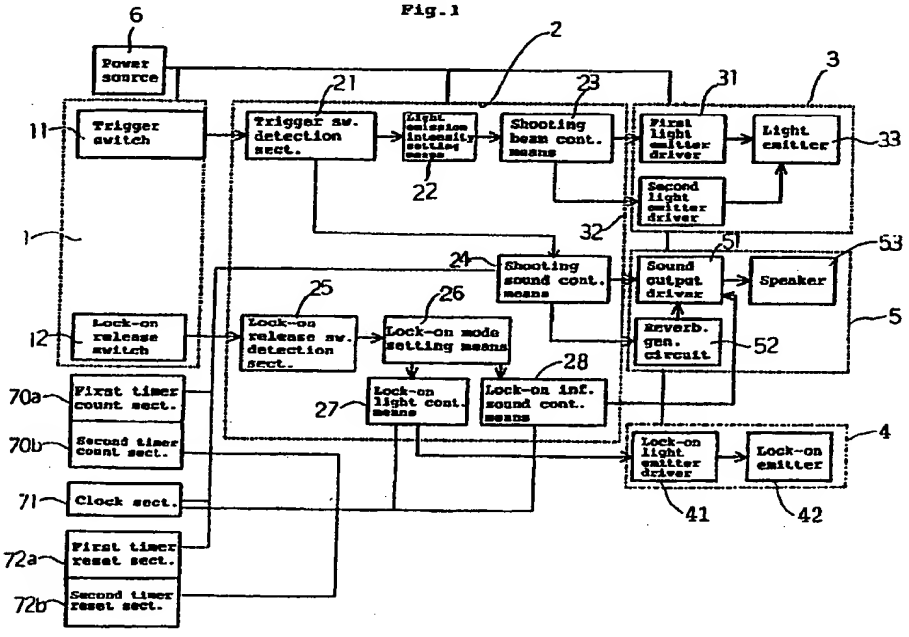

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Fig.1

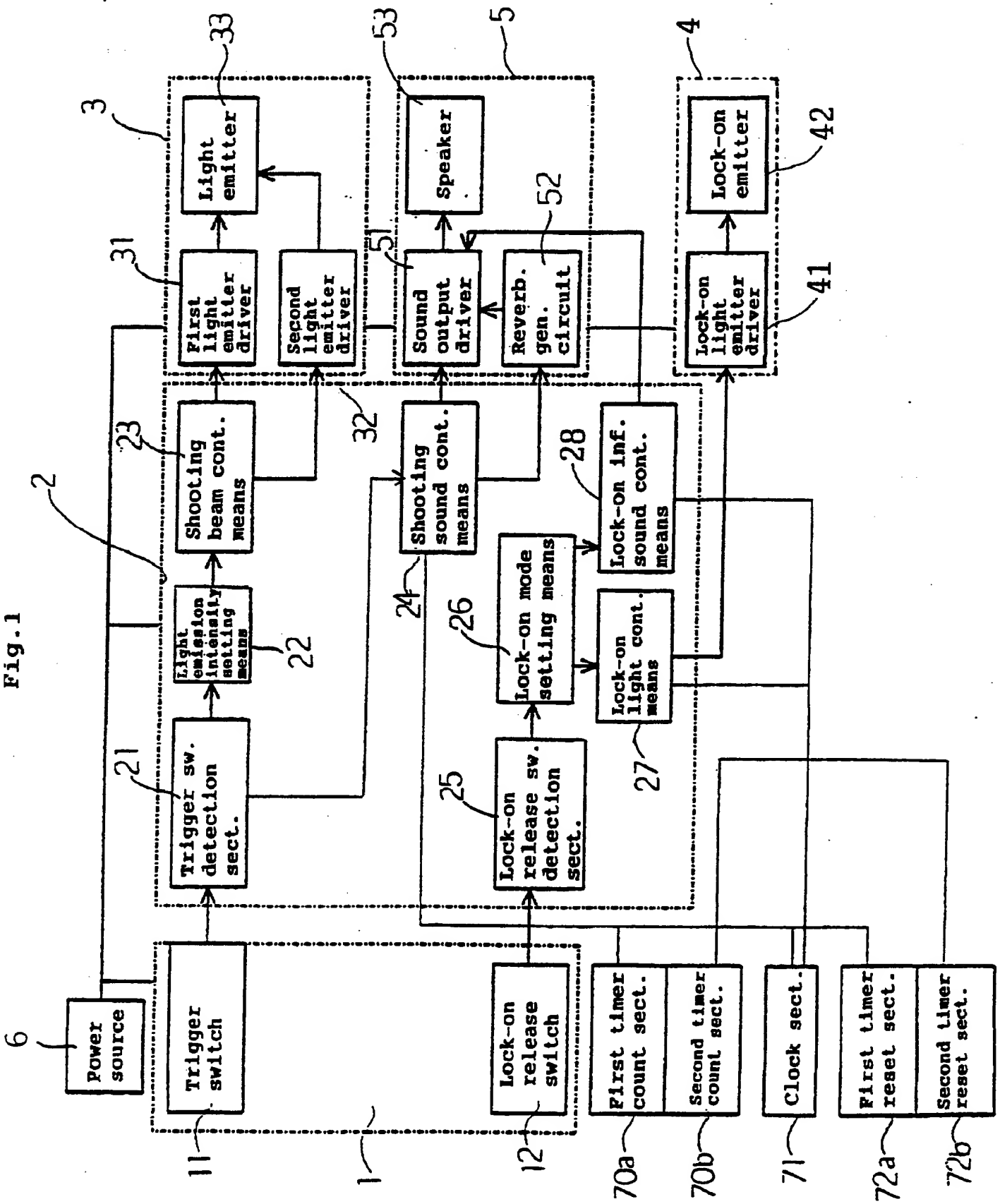


Fig.2

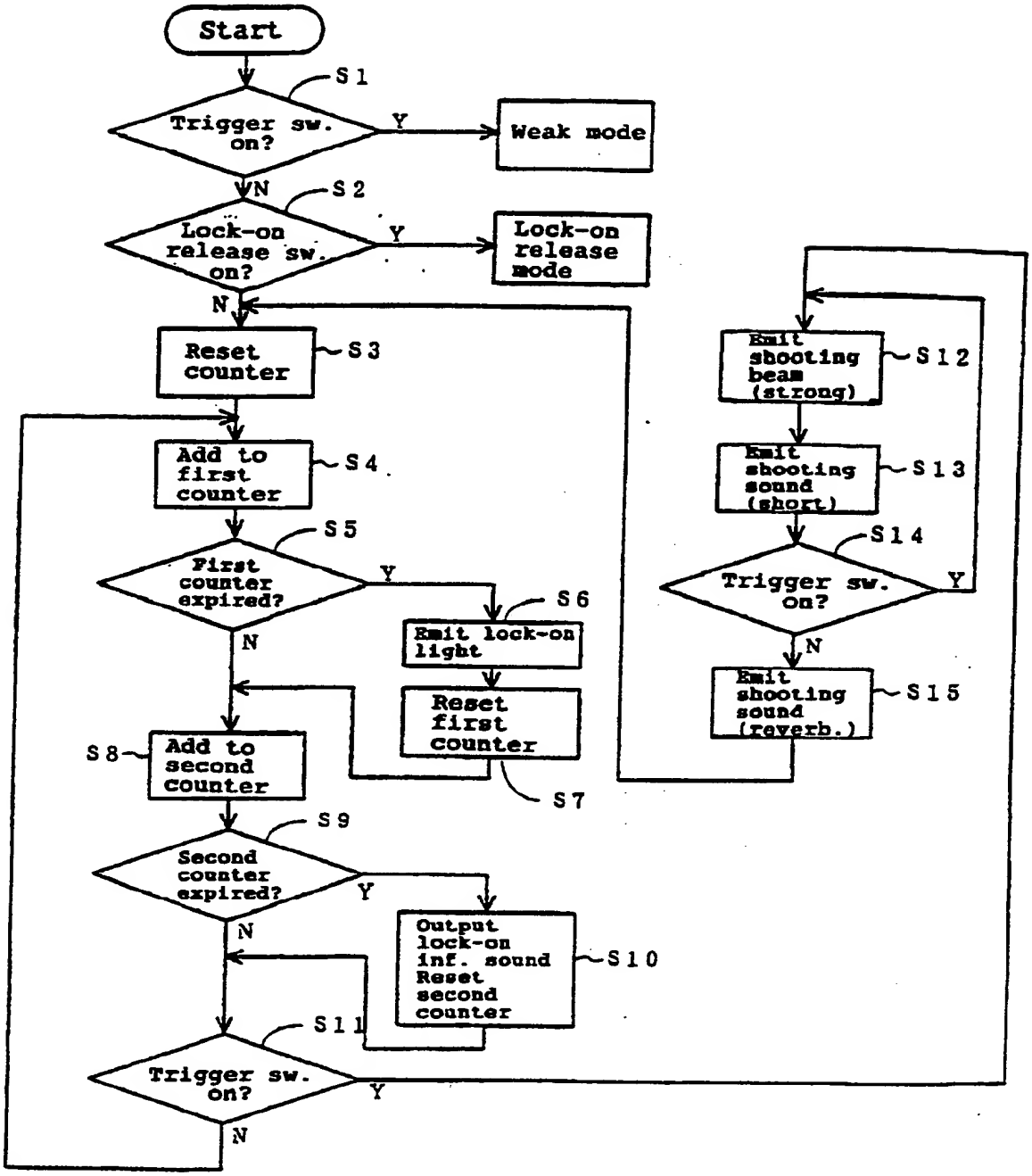


Fig.3

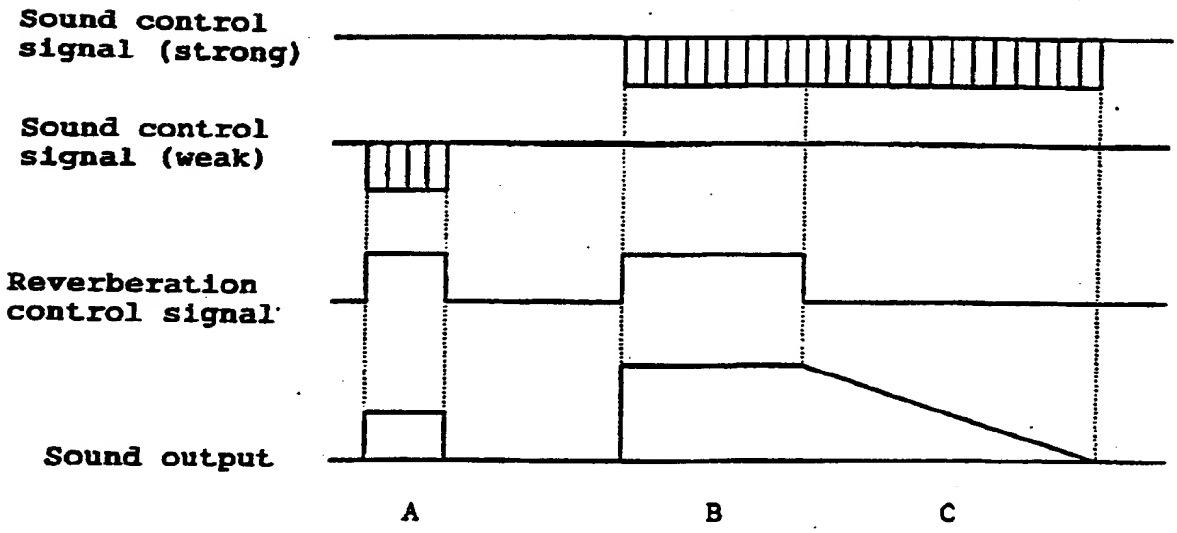
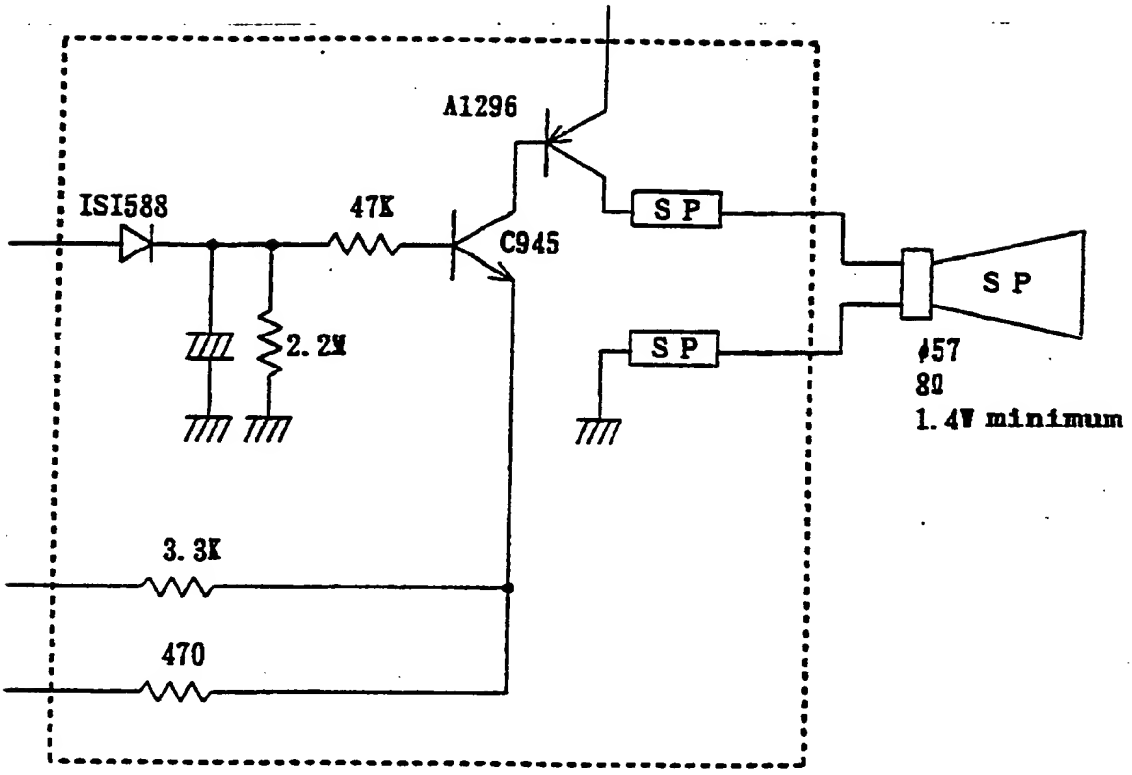


Fig.4



TITLE OF THE INVENTION

A Game Beam Gun

DETAILED DESCRIPTION OF THE INVENTION

[Field of the Invention]

This invention is concerned with a game beam gun enabling a beam of light (hereafter called a shooting beam), which is used for a bullet, to be increased or decreased.

[Prior Art]

There has been a mimic-battle-type game using a beam gun which uses a beam of light, such as an infrared ray, as bullets. In this game, a player tries to hit a target, mounted on the body of another player (e.g., on the head of the player), with a beam gun which emits a shooting beam. The target is equipped with a light sensor which detects a beam emitted from the beam gun of the shooting player, a signal generator which generates a signal to inform the player that he has hit the target, a controller which counts the number of times the shooting player has hit the target to determine the win or loss of the game, and associated power source units. On the other hand, a beam gun is equipped with a light emitter, such as a LED, which generates a shooting beam, a speaker which generates a sound

(hereafter called a shooting sound) as if a bullet was actually shot at the same time a beam is shot, a controller which controls the generation of a shooting beam and a shooting sound, a power source unit on each of them, and a trigger (hereafter called a trigger switch) which is used to shoot a beam.

[PROBLEMS TO BE SOLVED BY THE INVENTION]

A beam gun described above is required to emit as strong a beam as possible. This is because the game becomes more amusing if a shooting player can shoot a target player at a distance. However, when the player uses a beam gun capable of emitting a strong beam in a closed space, for example, in a room, the shooting beam reflects on the wall of the room and, as a result, the light sensor on the target player detects a beam even when the shooting player does not hit the target. This kills the interest of the shooting game. In addition, the game becomes more amusing if the player can adjust the intensity of a beam according to his age or experience. A conventional beam gun, which emits only one type of shooting beam, does not satisfy this requirement.

One solution to this problem is to provide a throttle for controlling the intensity of a shooting beam. For example, a throttle is provided in front of the light emitter to limit the amount of a shooting beam from the muzzle of the gun. However, for this type of beam gun, the throttle affects the optical axis of the shooting beam and diffuses a beam of light,

decreasing the hit ratio.

The prior art also has a problem in the generation of a shooting sound. That is, a conventional beam gun generates a synthesized shooting sound using a sound generation IC. This IC is much higher in price than other electronic parts such as resistors or transistors. In addition, a beam gun also has other ICs for controlling a timing in which a shooting beam or a shooting sound is generated as well as for calculating the number of remaining bullets. Adding a sound generation IC to a beam gun, which already uses a plurality of ICs, makes the gun more expensive and complex.

One solution to this problem is to generate a shooting sound using a IC now used for controllers. However, a control IC, which has a limited power, generates a sound simpler than that generated by a sound generation IC which is dedicated for generating a sound. For example, although a control IC can generate a sound in the same volume and in the same tone for a specific period of time, it cannot generate a sound which becomes lower little by little after shooting. This reduces the reality of a game.

One the of beam guns according to the present invention is a gun called a "lock-on type" beam gun. This beam gun allows a shooting player to emit a beam of light to a target player and, after taking aim at the target, to emit a shooting beam to the target. This lock-on type beam gun must be able to generate an information sound, in addition to a shooting sound, to inform that the shooting player is in the lock-on status. This lock-on

sound is weaker and shorter than a shooting sound. However, for a beam gun which uses a game control IC instead of a sound generation IC, it is difficult to generate a shooting sound as well as a lock-on sound. Even if such a beam gun can generate a lock-on sound, the ability to control a shooting sound is degraded and, as a result, the shooting sound becomes simpler.

It is an object of this invention to provide a game beam gun which has solved the problems given above.

More specifically, it is an object of the invention claimed in claim 1 to provide a game beam gun which allows a player to change the intensity or a shooting beam without using a throttle, in order to play a high hit-ratio game, indoor game, or handicapped game.

It is an object of the invention claimed in claim 2 to provide a game beam gun which allows a player to change the intensity of a shooting beam with the use of a shooting-beam trigger switch, one of the integral parts of a beam gun. This eliminates the need for providing a switch dedicated for changing the intensity of a shooting beam, making the beam gun structure simpler and reducing the number of parts.

It is an object of the invention claimed in claim 3 to provide a game beam gun which uses a reverberation generation circuit to generate a true shooting sound with the use of a simply-structured shooting sound control

means.

It is an object of the invention claimed in claim 4 to provide a game beam gun which allows a player to change the intensity of shooting beam and to generate a true shooting sound by combining claims 1 and 3.

It is an object of the invention claimed in claim 5 to provide a game beam gun which generates a true shooting sound simply by adding a circuit composed of simple electronic parts to the game control IC. This eliminates the need for using a sound generation IC.

It is an object of the invention claimed in claim 6 to provide a game beam gun which allows a player to change the intensity of light and which may be used also as a lock-on type gun.

[Means for Solving the Problems]

To achieve the above object, a game beam gun claimed in claim 1 comprises a power source; a trigger switch; a shooting beam control means connected to the trigger switch for emitting a shooting beam used as a bullet; a light emission intensity setting means connected to the shooting beam control means; a light emitter driver connected to the shooting beam control means; and a light emitter connected to the output of the light emitter driver.

A game beam gun claimed in claim 2 is a game beam gun, wherein the light emission intensity setting means is provided with a detector which, at power-on time, determines whether the trigger switch is on or off in order to set the intensity of an emitted light.

A game beam gun claimed in claim 3 comprises a power source; a trigger switch; a shooting beam control means connected to the trigger switch for emitting a shooting beam used as a bullet; a light emitter driver connected to the shooting beam control means; a light emitter connected to the output of the light emitter driver; a shooting sound control means connected to the trigger switch for generating a shooting sound; a reverberation generation circuit connected to the shooting sound control means; a sound output driver connected to the shooting sound control means and the reverberation generation circuit; and a speaker connected to the sound output driver.

A game beam gun claimed in claim 4 comprises a power source; a trigger switch; a shooting beam control means connected to the trigger switch for emitting a shooting beam used as a bullet; a light emission intensity setting means connected to the shooting beam control means; a light emitter driver connected to the shooting beam control means; a light emitter connected to the output of the light emitter driver; a shooting sound control means connected to the trigger switch for generating a shooting sound; a reverberation generation circuit connected to the

shooting sound control means; a sound output driver connected to the shooting sound control means and the reverberation generation circuit; and a speaker connected to the sound output driver.

A game beam gun claimed in claim 5 is a game beam gun wherein the shooting beam control means and the shooting sound control means are provided on one game control IC, and the reverberation generation circuit consisting of a combination of a plurality of single-function electronic parts is outside of the game control IC.

A game beam gun claimed in 6 further comprises a lock-on mode setting means; a lock-on light control means connected to the light emitter driver for emitting a lock-on light; and a lock-on information sound control means connected to the sound output driver for generating a lock-on information sound.

[Effects]

In the invention claimed in claim 1, when a player pulls the trigger with power on, the shooting signal is sent to the shooting beam control means connected to this trigger switch and, upon receiving this shooting signal, the shooting beam control means drives the light emitter driver to cause a light to be emitted from the light emitter. In addition, because the light emission intensity setting means is connected to the shooting beam control means, a strong or a weak shooting beam can be emitted from the

light emitter by setting the intensity of a shooting beam to either "strong" or "weak" with the use of the light emission intensity setting means.

In the invention claimed in claim 2, a player can set the intensity of emission light to "strong" or "weak" by setting the trigger switch to on or off before turning on the power. This eliminates the need for a switch dedicated for changing the intensity of emission light.

In the invention claimed in claim 3, when a player pulls the trigger with power on, the shooting signal is sent to the shooting beam control means connected to this trigger switch and, upon receiving this shooting signal, the shooting beam control means drives the light emitter driver to cause a light to be emitted from the light emitter. Upon receiving the shooting signal from the trigger switch, the shooting sound control means sends the shooting sound generation signal to the sound output driver and the reverberation generation circuit. Upon receiving this shooting sound generation signal, the reverberation generation circuit sends the reverberation control signal to the sound output driver. The sound output driver combines the shooting sound generation signal and the reverberation control signal to cause the speaker to generate only the shooting sound for a specified period of time and, after the specified time has elapsed, attenuates the shooting sound gradually to generate reverberations.

In the invention claimed in claim 4, the light emission intensity setting

means and the reverberation generation circuit change the intensity of the shooting beam and, at the same time, add the reverberation effects to the shooting sound.

In the invention claimed in claim 5, because the shooting beam control means and the shooting sound control means are provided on the same game control IC, and because the reverberation generation circuit consisting of a plurality of single-function electronic parts is outside of the game control IC, a shooting sound with reverberation effects is generated without having to use an IC for generating sounds.

In the invention claimed in claim 6, activating the lock-on mode setting means causes the lock-on light control means to send the lock-on output signal to the light emitter driver, causing the lock-on light emitter to emit lights, and the speaker to output an information sound.

[BRIEF DESCRIPTION OF THE DRAWINGS]

Figure 1

A block diagram showing an embodiment of a game beam gun according to this invention

Figure 2

A flowchart describing the processing of the embodiment in Figure 1

Figure 3

A waveform diagram showing output signal from the shooting sound control means and the reverberation generation circuit used in the embodiment in Figure 1

Figure 4

A circuit diagram showing the structure of the reverberation generation circuit in the block diagram in Figure 1

[Embodiment]

Referring now to Figure 1, there is shown a preferred embodiment of this invention.

(1) Structure of the embodiment

Figure 1 is a block diagram showing a preferred embodiment of a game beam gun according to this invention. As shown in Figure 1, a beam gun used in this embodiment comprises the signal input means 1 for accepting various types of signal, the signal control section 2 contained in the game control IC and connected to the signal input means 1, the shooting beam generation means 3 which shoots a shooting beam upon receiving a signal from the signal control section 2, the lock-on light generation means 4 which shoots a lock-on light, the shooting sound generation means 5 which

generates a shooting sound or a lock-on sound, and the power source 6 which supplies power to each section described above.

In this embodiment, the signal input means 1 contains the trigger switch 11 which shoots a shooting beam and the lock-on release switch 12. In addition to these two switches, it may also contain a team select switch used to identify a team for use in a game in which two or more teams participate and a hyper-switch used to shoot two or more bullets (shooting beams) at a time.

The signal control section 2 has the trigger switch detection section 21 which detects the on-off state of the trigger switch 11. The trigger switch detection section 21 is connected to the light emission intensity setting means 22, and the light emission intensity setting means 22 is connected to the shooting beam control means 23. The light emission intensity setting means 22 detects the on-off state of the trigger switch 11 when power is supplied from the power source 6 and, according to the on-off state of the switch, sends the light emission intensity setting signal to the shooting beam control means 23. For example, when power is supplied with the trigger switch 11 in the on position, the intensity setting signal for decreasing the light emission intensity is sent to the shooting beam control means 23; conversely, when power is supplied with the trigger switch 11 in the off position, the intensity setting signal for increasing the light emission intensity is sent to the shooting beam control means 23. The shooting beam control means 23 is connected to the first and second

light emitter drivers 31 and 32. The light emitter drivers 31 and 32 are connected to the light emitter 33. The first light emitter driver 31 causes the light emitter 33 to generate a strong shooting beam, and the second light emitter driver 32 causes light emitter 33 to generate a weak shooting beam.

The shooting sound control means 24 is connected to the trigger switch detection section 21. The first timer count section 70a, the clock section 71, and the first timer reset section 72a are connected to this shooting sound control means 24. The shooting sound control means 24 is connected to the sound output driver 51 and the reverberation generation circuit 52 provided in the shooting sound generation means 5. The output from the reverberation generation circuit 52 is sent to the sound output driver 51. This reverberation generation circuit 52, which is constructed on an IC separate from the game control IC where the signal control section 2 is implemented, consists of a plurality of single-function electronic parts such as resistors, transistors, diodes, and capacitors. Figure 4 is a circuit diagram showing an example of the reverberation generation circuit 52 and the sound output driver 51 consisting of such single-function parts.

The signal control section 2 contains the lock-on release switch detection section 25 which detects the on-off sate of the lock-on release switch 12. This lock-on release switch detection section 25 is connected to the lock-on mode setting means 26, and this lock-on mode setting

means 26 is connected to the lock-on light control means 27. The lock-on light control means 27 is connected to the lock-on emitter 42 via the lock-on light emitter driver 41. The lock-on mode setting means 26 is connected to the lock-on information sound control means 28, and this lock-on information sound control means 28 is connected to the sound output driver 51. The second timer count section 70b, the clock section 71, and the second timer reset section 72b are connected to the lock-on light control means 27 and the lock-on information sound control means 28.

(2) Effect of the embodiment

Referring to the flowchart in Figure 2, there is shown the effect of this embodiment.

When the trigger switch detection section 21 detects that the trigger switch 11 is in the off position at power-on time, the signal is sent to the light emission intensity setting means 22. Then, the setting signal from the light emission intensity setting means 22 causes the shooting beam control means 23 to be placed in the strong shooting beam mode (step 1). At the same time, when the the lock-on release switch 12 is in the off position at power-on time, the lock-on release switch detection section 25 detects that the switch is in the off position, and the signal from the detection section 25 causes the lock-on mode setting means 26 to be placed in the lock-on mode (step 2). Once in the lock-on mode, the signal

from the first and second timer reset sections 72a and 72b resets the first and second timer count sections 70a and 70b (step 3) and then, upon receiving the signal from the clock section 71, the both timer count sections 70a and 70b start addition (step 4).

When the setting time in the second timer count section 70b has expired (step 5), the signal from the second timer count section 70b causes the lock-on light control means 27 to start the lock-on light emitter driver 41 to emit a lock-on light from the lock-on emitter 42 (step 6). After emitting the lock-on light, the signal from the second timer reset section 72b resets the second timer count section 70b (step 7). Then, when the setting time in the first timer count section 70a which has been counted (step 8) from the reset point in step 3 has expired (step 9), the signal from the first timer count section 70a causes the lock-on information sound control means 28 to start the sound output driver 51 to generate the lock-on information sound from the speaker 53. At the same time this lock-on information sound is output, the signal from the first timer reset section 72a resets the first timer count section 70a (step 10).

A lock-on light and an information sound mentioned above are repeatedly generated while the trigger switch 11 is in the off position. That is, when the player has not yet pulled the trigger switch 11 and, therefore, a shooting beam is not yet shot, a lock-on light and an information sound informing the lock-on state are shot from the beam gun at a specified interval. When the trigger switch 11 is set to the on position

while a lock-on light and an information sound are generated (step 11), the trigger switch detection section 21 detects this state and, upon receiving the signal from this trigger switch detection section 21, the shooting beam control means 23 sends the shooting signal of a shooting beam to the emitter driver. In this case, because the light emission intensity setting means 22 has put the shooting beam in the strong mode as described in step 1, the shooting beam control means 23 sends the shooting signal of a shooting beam to the first light emitter driver 31. Upon receiving this shooting signal, the light emitter driver 31 causes the light emitter 33 to shoot a strong shooting beam (step 12).

Then, the signal from the trigger switch detection section 21 causes the shooting sound control means 24 to send the sound control signal to the sound output driver 51 and to the reverberation generation circuit 52. According to the sound control signal from the shooting sound control means 24, the reverberation generation circuit 52 sends the reverberation generation signal to the sound output driver 51 at a specified interval, as shown in A in the output waveform diagram in Figure 3. The sound output driver 51 checks the sound control signal from the shooting sound control means 24 against this reverberation generation signal and, when both signals are present, sends a fixed-level sound to the speaker 53. That is, when the trigger switch 11 is in the on position as described above, the sound control signal is sent from the shooting sound control means 24 to the sound output driver 51 in order to output a low-level (low) sound for a short period. At the same time, the signal is sent to the reverberation

generation circuit 52 in order to generate the reverberation generation signal from the reverberation generation circuit 52 for the same period of time. As a result, the sound output driver 51, which receives both the reverberation generation signal and the sound control signal for a short period, generates a low-level, non-reverberated, short-period sound from the speaker 53. More specifically, a short-period sound "dah" is generated from the speaker 53 (step 13).

If the trigger switch 11 remains in the on position after the short sound "dah" is output, the shooting beam in step 12 and the short-lasting shooting sound in step 13 are generated repeatedly (YES in step 14). If the trigger switch is in the off position after the short sound "dah" is output, reverberations are output (NO in step 14).

That is, when the signal is received from the trigger switch detection section 21, the shooting sound control means 24 sends a high-level (high sound), long-lasting sound control signal, as shown in B in the waveform diagram in Figure 3, to the sound output driver 51. When no reverberation generation signal is sent to the sound output driver 51, this sound control signal causes the sound output driver 51 to output a sound which becomes gradually lower from the speaker 53. Another control signal is sent from the shooting sound control means 24 to the reverberation generation circuit 52 at the same time the above mentioned sound control signal is output, in order to cause the sound output driver 51 to generate a reverberation generation signal which lasts shorter than the sound control signal. As a result, the sound output driver 51 checks the sound control

signal from the shooting sound control means 24 against the reverberation generation signal from the reverberation generation circuit 52 and, when both signals are present, sends a fixed level sound to the speaker 53. And, when only the sound control signal is sent but without the reverberation generation signal, as shown in C in the waveform diagram in Figure 3, a shooting sound which gradually becomes lower is output from the speaker 53. More specifically, the reverberations of a shooting sound "zip", which becomes gradually lower, is output from the speaker 53. (step 15)

After this type of reverberations are output, control returns to step 3 to reset the counters and, then, the the beam gun is placed in the lock-on mode again to generate a lock-on light and a lock-on information sound repeatedly.

When power is supplied with the trigger switch 11 in the on position, the beam gun enters the weak shooting beam mode, as described in step 1. In this mode, a lock-on light, a lock-on information sound, and a shooting sound are output as in the strong shooting beam mode described above. However, when outputting a shooting beam, the light emission intensity setting means 22 sends the weak mode setting signal to the shooting beam control means 23 according to the signal from the trigger switch detection section 21 which detects the on-off state of the trigger switch 11. As a result, when a shooting beam is shot in step 12, the second light emission driver 32 is started to cause the light emitter 33 to generate a weak shooting beam. As a result, there are less shooting beam reflections and,

so, the player will find the beam gun game more amusing even in a closed place, for example, when he plays it in a room.

In addition, the beam gun enters the lock-on release mode when the lock-on release switch 12 is in the on position in step 2. This lock-on release mode prevents a lock-on light and a lock-on information sound from being generated in steps 3 - 10. This mode allows a player to approach the target quietly, making the game more amusing.

(3) Other embodiments

This invention is not limited to the above described embodiment, but includes other embodiments described below. For example, instead of the light emission intensity setting means which detects the on-off state of the trigger switch at power-on time and, based on the result, changes the intensity of the shooting beam, a mechanical switch dedicated for changing the light emission intensity may be provided in the light emission signal output circuit on the game control IC. In addition, instead of the trigger switch, the on-off state of another switch may be checked to change the intensity. A plurality of light emitters, which may be controlled by the light emission intensity setting means, may also be used for changing the intensity. The invention claimed in 1 or 5 may be applied to a non-lock-type game beam gun as well.

[Effect of the Invention]

According to this invention, the light emission intensity setting means connected to the shooting beam control means enables a player to set the intensity of a shooting beam to "strong" or "weak" in advance, and allows him to cause the light emitter to emit either a strong or a weak shooting beam. This makes it possible to play the beam gun game even in a room and to impose a handicap on players to make the game more amusing. In addition, the reverberation generation circuit contained in the shooting sound control means makes it possible to add reverberations to simple sounds. Especially, the shooting sound control means constructed by a game control IC as well as the reverberation generation circuit composed of single-function electronic parts such as transistors, resistors, and capacitors reduces the number of costly ICs while maintaining the superior quality of shooting sounds.

WHAT I CLAIMED IS:

1. A game beam gun comprising:

a power source;

a trigger switch;

a shooting beam control means connected to said trigger switch for emitting a shooting beam used as a bullet;

a light emission intensity setting means connected to said shooting beam control means;

a light emitter driver connected to said shooting beam control means; and

a light emitter connected to the output of said light emitter driver.

2. A game beam gun as claimed in claim 1, wherein said light emission intensity setting means is provided with a detector which, at power-on time, determines whether said trigger switch is on or off in order to set the intensity of an emitted light.

3. A game beam gun comprising:

a power source;

a trigger switch;

a shooting beam control means connected to said trigger switch for emitting a shooting beam used as a bullet;

a light emitter driver connected to said shooting beam control means;

a light emitter connected to the output of said light emitter driver;

a shooting sound control means connected to said trigger switch for generating a shooting sound;

a reverberation generation circuit connected to said shooting sound control means;

a sound output driver connected to said shooting sound control means and said reverberation generation circuit; and

a speaker connected to said sound output driver.

4. A game beam gun comprising:

a power source;

a trigger switch;

a shooting beam control means connected to said trigger switch for emitting a shooting beam used as a bullet;

a light emission intensity setting means connected to said shooting beam control means;

a light emitter driver connected to said shooting beam control means;

a light emitter connected to the output of said light emitter driver;

a shooting sound control means connected to said trigger switch for generating a shooting sound;

a reverberation generation circuit connected to said shooting sound control means;

a sound output driver connected to said shooting sound control means and said reverberation generation circuit; and

a speaker connected to said sound output driver.

5. A game beam gun as claimed in claim 3 or 4, wherein said shooting beam control means and said shooting sound control means are provided on one game control IC, and said reverberation generation circuit consisting of a combination of a plurality of single-function electronic parts is outside of said game control IC.

6. A game beam gun as claimed in claim 1, 2, 3, 4, or 5, further comprising:

a lock-on mode setting means;

a lock-on light control means connected to said light emitter driver for emitting a lock-on light; and

a lock-on information sound control means connected to said sound output driver for generating a lock-on information sound.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
The Search report)

Application number
GB 9423819.3

Relevant Technical Fields

(i) UK Cl (Ed.N) F3C (CTE)

(ii) Int Cl (Ed.6) F41A

Search Examiner
TREVOR BERRY

Date of completion of Search
8 JANUARY 1995

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
1, 2, 4, 5 AND 6

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2259559 A	(WATKINS) note page 6 lines 13 to 21	1
X	GB 2200732 A	(TOMY KOGYO) note page 5 lines 4 to 14	1
X	GB 1595189	(LASPO) note page 4 lines 48 to 55	1
X	GB 1383564	(SOLARTRON) note page 3 lines 3 to 73	1
X	US 5243894	(MINOVITCH) note column 4 line 64 to column 5 line 51	1
X	US 4830617	(ACCLES) note column 11 lines 43 to 45	1

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(54) **Mit einem Laser ausgestattetes Wechselsystem für Faustfeuerwaffen für die Durchführung von Schiessübungen.**

(57) Die Erfindung betrifft ein Wechselsystem für Kurzwaffen, bei welchem ein Laser anstelle der sonst verwendeten Munition verwendt wird, wobei der Laserstrahl in einem nahen Bereich vor der Waffe in der Flugbahn des sonst verwendeten Geschosses verläuft.

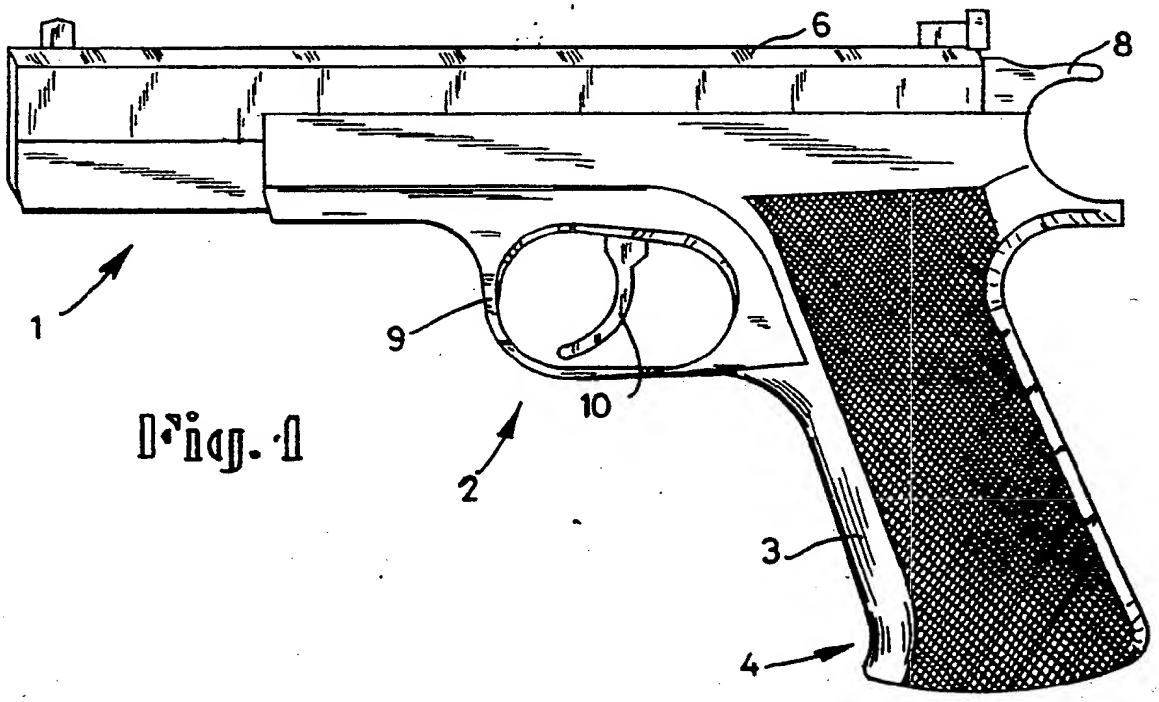


Fig. 1

EP 0 401 731 A1

Die Erfindung betrifft ein Wechselsystem für Kurzwaffen.

Es ist bekannt, für Pistolen das System, welches den Lauf, den Verschluß und weitere Teile der Waffe umfaßt und welches vom Griffstück der Waffe abziehbar ausgebildet ist, durch ein sogenanntes Wechselsystem zu ersetzen. Insbesondere für Sportschützen ist dabei vorteilhaft, daß das Wechselsystem das Verschießen von Munition kleineren Kalibers ermöglicht. Insbesondere für die Besitzer großkalibriger Kurzwaffen verbessern sich dadurch die Trainingsmöglichkeiten, da die Kosten pro Schuß reduziert werden und die Anzahl der zum Training geeigneten Schießstände sich vergrößert.

Die Trainingsmöglichkeiten bleiben dennoch auf die Schießstände begrenzt, sowohl in zeitlicher als auch in räumlicher Hinsicht. Die funktionsfähige Waffe bleibt nämlich auch mit eingesetztem Wechselsystem eine Waffe, mit der das Trainieren nur auf Schießständen erlaubt ist.

Es ist weiterhin bekannt, Laserpatronen zu verwenden, die beim Auftreffen des Schlagbolzens auf die Patrone einen Laserstrahl aussenden. Um die Verwendung solcher Laserpatronen in verschiedenen Waffen zu ermöglichen, sind Reduzierstücke zur Aufnahme einer Laserpatrone, z. B. aus dem Gebrauchsmuster G 88 13 643, bekannt. Die Trainingskosten lassen sich durch derartige Patronen senken. Die funktionsfähige und ggf. scharfe Waffe bleibt dabei jedoch eine Waffe im Sinne des Waffengesetzes und darf nur auf Schießständen verwendet werden.

Weiterhin sind spezielle Trainingsgeräte bekannt, beispielsweise aus der EP-0 262 543. Ein derartiges Trainingsgerät ist pistolenähnlich aufgebaut und umfaßt eine Lasereinrichtung. Bei Verwendung eines unsichtbaren Lasers sind spezielle Zielscheiben erforderlich, um die Trefferlage anzuzeigen. Bei Verwendung eines sichtbaren Lasers jedoch kann mit derartigen Trainingsgeräten auch unabhängig von einem Schießstand zu Hause in der Wohnung oder an beliebigen Orten trainiert werden. Der Nachteil derartiger Trainingsgeräte besteht darin, daß viele der Charakteristika, die die später im Wettkampf verwendete Waffe ausmachen, nicht mit dem Trainingsgerät übereinstimmen, z. B. Gewicht, Schwerpunkt, Druckpunkt u. dgl. Derartige Trainingsgeräte werden daher zur ernsthaften Vorbereitung auf Wettkämpfe nicht verwendet.

Aufgabe der Erfindung ist es, ein Wechselsystem zu schaffen, um eine funktionsfähige Waffe wechselweise als Waffe oder Trainingsgerät verwendbar zu machen und dem Schützen in beiden Verwendungsfällen ein identisches Handhabungsgefühl zu vermitteln.

Diese der Erfindung zugrundeliegende Aufgabe wird gelöst durch die Verwendung einer Lasereinrichtung anstelle einer der an der Schußentwicklung beteiligten Hauptbaugruppen der Waffe.

Auf diese Weise wird die Waffe, mit der der Wettkampf ausgetragen wird, als Trainingsgerät verwendbar und die meisten der charakteristischen Eigenschaften der Waffe bleiben für das Training erhalten. Durch das Wechselsystem entfällt eine der an der Schußentwicklung beteiligten Hauptbaugruppen, so daß es sich nach Einsatz des Wechselsystems nicht mehr um eine Waffe im Sinne des Waffengesetzes handelt, sondern um ein Trainingsgerät, mit dem auch die unbeabsichtigte Auslösung eines Schusses unmöglich ist. Zum Training sind daher nicht nur Schießstände geeignet, so daß das Training an nahezu beliebigen Orten und zu beliebigen Zeiten stattfinden kann, da weder eine Gefährdung noch eine Geräuschentwicklung stattfindet.

Ein Drucksensor, der den Aufschlag des Hahns registriert, bewirkt das Aufleuchten des Lasers, so daß, wie im Training mit scharfer Munition, erst nach dem Abziehen die Trefferlage deutlich wird. Dabei kann vorteilhafterweise eine Schaltung die Leuchtdauer des Lasers auf einen gewissen zeitlichen Bereich begrenzen, so daß anschließend das Trainingsgerät für einen erneuten Schuß zur Verfügung steht.

Die Batterien für den Laser können vorzugsweise im Wechselsystem selber oder im Munitionsschacht, d. h. im Griff des Trainingsgerätes untergebracht sein.

Um eine möglichst realistische Handhabung des Gerätes im Training zu ermöglichen, ist es vorteilhaft, das Gewicht, die Gewichtsverteilung, die äußeren Abmessungen sowie die Visierlinie des Wechselsystems entsprechend den Vorgaben des Originalsystems auszubilden.

Bei der Ausbildung eines solchen Wechselsystems als Trommelersatz ist vorteilhafterweise die Trommel nicht drehbar ausgebildet, so daß ein einziger Laser fest positioniert angeordnet ist.

Die Zeichnung zeigt ein Ausführungsbeispiel eines erfindungsgemäßen Wechselsystems. Dabei zeigt

Fig. 1 die Waffe im zusammengesetzen Zustand und

Fig. 2 das Griffstück der Waffe sowie das erfindungsgemäße Wechselsystem.

Die in Fig. 1 dargestellte Waffe besteht im wesentlichen aus einem System 1. Das System 1 kann von einem Griffstück 2 abgenommen werden, so daß das Griffstück 2, wie in Fig. 2 dargestellt, isoliert verbleibt, und zwar mit einem Griff 3, in dem ein Magazinschacht 4 untergebracht ist und Führungen 5 für das System 1. Anstelle des Systems 1 kann ein Wechselsystem 6 aufgesetzt werden, welches einen Laser, Batterien sowie einen

Drucksensor umfaßt. Der Laser ist dabei so ausgerichtet, daß sein Laserstrahl entlang der Achse verläuft, die im System 1 durch den Lauf beschrieben würde, so daß der Laserstrahl die Geschoßbahn zumindest in dem ersten Teil ihrer ballistischen Kurve beschreibt.

Der Drucksensor ist dabei vorzugsweise in einem Bereich 7 angeordnet, in dem ein Hahn 8 am System 1 anliegt, wobei die Empfindlichkeit des Drucksensors so ausgebildet ist, daß beim Aufschlagen des Hahns 8 der Durcksensor anspricht.

Der Drucksensor dient als Einschaltkontakt für den Laser, wobei die Einschaltdauer des Lasers durch eine elektronische Schaltung auf einige Sekundenbruchteile beschränkt werden kann. Dadurch bleibt im Auge des Betrachters auch bei Bewegungen des Trainingsgerätes nach dem Schuß die klare Vorstellung darüber erhalten, wo der Schuß mit scharfer Munition gelegen hätte.

Der Drucksensor kann alternativ auch im Bereich eines Abzugsbügels 9 hinter einer Abzugszunge 10 angeordent sein, so daß auch ohne Betätigen des Hahns 8 die Schußsimulation erfolgt und damit ein völlig verschleißfreies Üben mit dem Trainingsgerät möglich wird.

Alternativ zur Anordnung im Wechselsystem 6 können die Batterien für den Laser auch im Magazinschacht 4 angeordnet sein, um so eine Gewichtsverteilung der Waffe mit gefülltem Magazin zu simulieren.

Um weiterhin eine möglichst wirklichkeitsnahe Handhabung der Waffe zu simulieren, kann das Wechselsystem 6 sowohl in den Abmessungen als auch im Gewicht und der Gewichtsverteilung dem System 1 entsprechen, was die Wirksamkeit des Trainings wesentlich verbessert. Insbesondere die Höhe des Wechselsystems 6 sowie die Ausbildung seiner Visierlinie entspricht dabei vorteilhafterweise den Werten des Systems 1.

Auf diese Weise wird ein Trainingsgerät geschaffen, welches in beliebigen geschlossenen Räumen das Training mit Zielansprache auf beliebige Gegenstände ermöglicht, wobei insbesondere auch jede Lärmentwicklung unterbleibt, so daß die Einsatzmöglichkeiten der Waffe als Trainingsgerät räumlich und zeitlich nahezu uneingeschränkt sind.

Wechselsysteme, die für eine Verwendung in Revolvern angepaßt sind, sind vorteilhafterweise in Form einer Ersatztrommel ausgebildet, die den Laser, die Batterien und den Drucksensor aufnimmt. Um dabei lediglich einen Laser zu verwenden, ist bei einem derartigen Trommelersatz vorteilhafterweise die Rotation der Trommel dadurch verhindert, daß anstelle der Anlageflächen für den Transport der Trommel entsprechende Ausnehmungen oder Ausfräsungen geschaffen sind.

Ansprüche

1. Wechselsystem für Kurzwaffen, gekennzeichnet durch die Verwendung einer Lasereinrichtung anstelle einer der an der Schußentwicklung beteiligten Hauptbaugruppen der Waffe.

2. Wechselsystem nach Anspruch 1, gekennzeichnet durch einen im Aufschlagbereich des Hahns (8) der Waffe angeordneten Drucksensor, der als Einschaltkontakt für den Laser ausgebildet ist.

3. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, gekennzeichnet durch eine Schaltung, die die Zeitdauer der Lichtaussendung bestimmt.

4. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die für den Laser verwendeten Batterien im Munitionsschacht (4) der Waffe angeordnet sind.

5. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Batterien im Wechselsystem (6) selbst angeordnet sind.

6. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Wechselsystem (6) dasselbe Gewicht wie das Originalsystem (1) aufweist.

7. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Wechselsystem (6) die gleiche Gewichtsverteilung (Ausbalancierung) wie das Originalsystem (1) aufweist.

8. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, gekennzeichnet durch mit den äußeren Abmessungen des Originalsystems (1) übereinstimmende äußere Abmessungen.

9. Wechselsystem nach einem oder mehreren der vorhergehenden Ansprüche, gekennzeichnet durch eine dem Originalsystem (1) entsprechende Visierlinie.

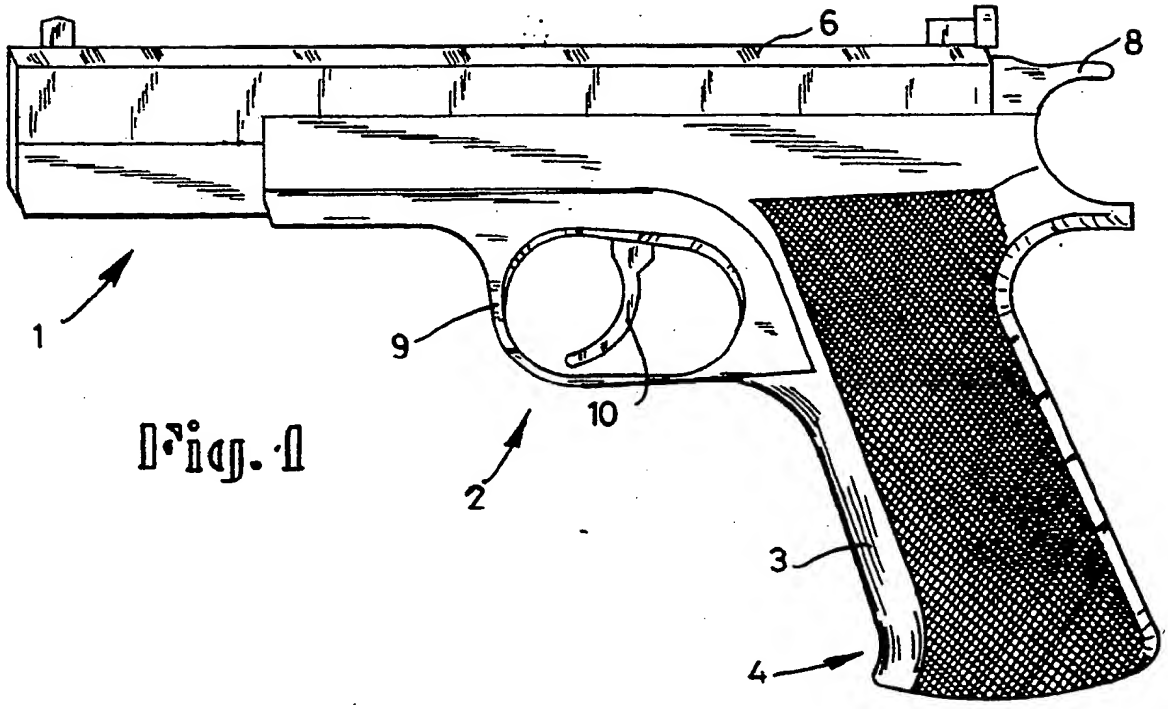
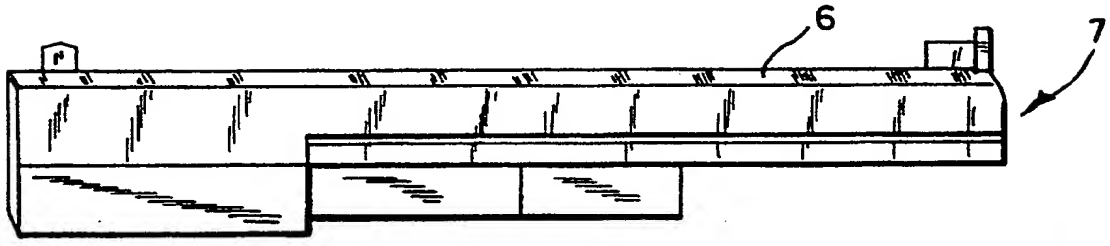


Fig. 1



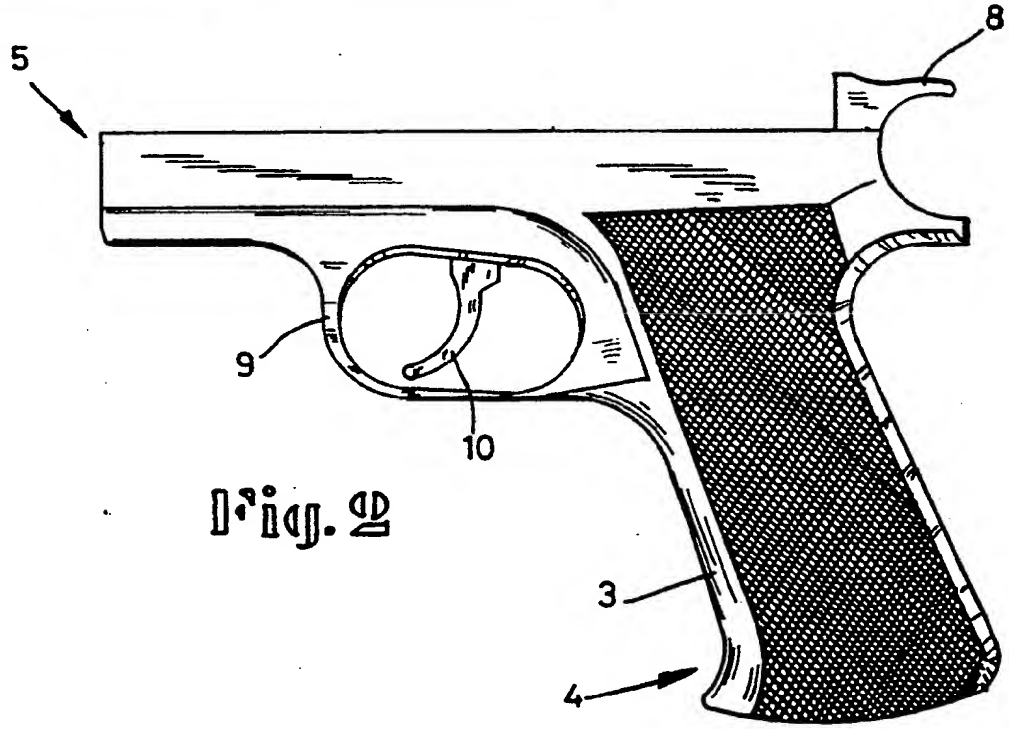


Fig. 2

Europäisches Patentamt

EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung

EP 90 11 0576

EINSCHLÄGIGE DOKUMENTE

Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int. Cl.5)
X	US-A-1451294 (BRIGNY DOUCET) * Seite 1, Zeilen 41 - 70; Figuren 1, 4 * * Seite 1, Zeile 85 - Seite 2, Zeile 5 * * Seite 2, Zeilen 25 - 27 *	1, 6-8	F41A33/02
X	US-A-3364345 (DAVIS) * Spalte 1, Zeilen 28 - 38; Figuren 5-8 * * Spalte 1, Zeilen 56 - 66 * * Spalte 2, Zeilen 7 - 10 * * Spalte 3, Zeile 62 - Spalte 4, Zeile 65 *	1, 4, 8, 9	
X	US-A-3655192 (HALL R.) * Spalte 1, Zeilen 57 - 75; Figur 1 * * Spalte 2, Zeile 48 - Spalte 3, Zeile 35 * * Spalte 3, Zeilen 61 - 62 *	1, 3, 4, 9	
Y		6, 8	
Y	FR-A-1389406 (LOSFELD) * Seite 1, linke Spalte, Absatz 1 - rechte Spalte, Absatz 1; Figuren 1, 2 * * Seite 2, linke Spalte, Absatz 2,3; Figuren 1, 2 *	6, 8	

RECHERCHIERTE SACHGEBIETE (Int. Cl.5)
F41A
F41G

Der vorliegende Recherchenbericht wurde für alle Patentansprüche erstellt

Recherchenort	Abschlußdatum der Recherche	Prüfer
DEN HAAG	24 AUGUST 1990	VAN DER PLAS J.

KATEGORIE DER GENANNTEN DOKUMENTE

X : von besonderer Bedeutung allein betrachtet
Y : von besonderer Bedeutung in Verbindung mit einer anderen Veröffentlichung derselben Kategorie
A : technologischer Hintergrund
O : nichtschriftliche Offenbarung
P : Zwischenliteratur

T : der Erfindung zugrunde liegende Theorien oder Grundsätze
E : älteres Patentdokument, das jedoch erst am oder nach dem Anmeldedatum veröffentlicht worden ist
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L : aus andern Gründen angeführtes Dokument

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